DEPARTMENT OF HEALTH & HUMAN SERVICES

494326
Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333
July 13, 1999

Ms. Bonnie Lavelle
Remedial Project Manager
EPA Region VIII
999 18th Street, Suite 500
Denver, CO 80202-2466

Re: ATSDR comments on Phase III sampling plan for the VBI-70 site, Denver, Colorado

Dear Ms. Lavelle:

Thank you for the opportunity to comment on EPA's sampling plan for the Vasquez Boulevard and I-70 (VBI-70) Site. ATSDR's comments are listed below.

1. The proposed sampling plan of collecting three composite samples from residential yards, parks, and schools does not protect children from harmful exposures to arsenic at the VBI70 site. The composite sampling plan may miss toxicologically significant "hot spots" of arsenic. In EPA's risk-based sampling report, location #10 shows a property where most of the arsenic levels in the yard are very low while a few locations have high arsenic levels in soil. As shown in ATSDR's presentation to EPA's technical subgroup on June 10, 1999, children with high soil intake could have a one-time exposure to arsenic in soil that is at doses that could significantly harm their health.

2. ATSDR recommends that EPA use the five subsections described in the sampling plan to define each composite sample. Therefore, the six grab samples from subsection one will be combined to form composite sample #1 and so on. Using each subsection as an individual composite provides a better chance of detecting "hot spots" of arsenic. Properties such as parks and school yards and very large residential properties may require more subsections.

3. In attachment 1 for acute exposures, ATSDR recommends using a soil intake level of 5,000 mg/day as a more realistic intake level for children with high soil intake (see Calabrese and Stanek, ELR News and Analysis, 28: 10660-10670, 1998.) EPA should note that Calabrese reports a case in his studies where a 2-year-old girl ingested 20 grams of soil per day.

4. In attachment 1 for acute exposures, ATSDR recommends using 10 kg body weight rather than the average weight of a child aged one to six. The reason for this change is that a one to two years old child is at greatest risk because of their lower body weight.

5. In attachment 1 for acute exposures, EPA is using an outdated acute Minimal Risk Level (MRL). ATSDR's 1999 draft Toxicological Profile for Arsenic does not cite an acute, oral MRL for arsenic. In ATSDR's presentation to EPA's technical working group for the VBI70 site on June 10, 1999, ATSDR presented several papers showing that harmful effects could occur in humans exposed one time to 0.06 mg of solubilized As/kg/day.

6. At the acute RBC of 7,500 mg/kg arsenic proposed in Appendix 1, the estimated dose for children with a one-time exposure at 7,500 mg/kg is 2 to 3 mg/kg/day. That dose has caused severe gastrointestinal effects and neurological effects (Mizuta et. al. 1956; Franzblau and Lilis 1989) (see ATSDR's 1999 Toxicological Profile for citations.) That dose is also dangerously close to levels that could cause hemorrhagic bronchitis, gastrointestinal bleeding, acute renal failure, encephalopathy, and peripheral neuropathy. ATSDR strongly recommends that EPA withdraw this RBC. Note: Table 2-3 in the toxicological profile reports exposure periods of two to three weeks in the Mizuta paper and one to two months in the Franzblau paper. A closer read of the papers shows that harmful effects occurred within 24 hours of exposure, making the papers appropriate to use to evaluate a one-time exposure in children. Also, the dose in the Franzblau paper is incorrectly reported in the profile. The actual dose is 0.06 mg/kg/day.

7. Children with high soil intakes are likely to do so several times in a short period (see Calabrese's ELR paper). It's reasonable to assume that a child could have high soil intake (5,000 mg/day) three times in one week, which gives a dose of 1.6 mg/kg/day. That dose is close to the 2 mg/kg/day dose that has caused peripheral neuropathy and death in humans (Armstrong et al, 1984).

8. ATSDR recommends that since GFAA or ICP/MS is being used for indoor dust samples that the same analytical methods be used for the corresponding outdoor soil samples. Using the same analytical method will allow a better comparison between outdoor soil levels and indoor dust levels.

Sincerely,

David Mellard

David Mellard, Ph.D.